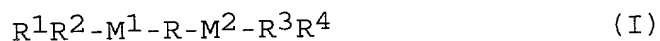


PROCESS FOR THE CARBONYLATION OF PENTENENITRILE

Abstract of the Disclosure

Processes to prepare 5-cyanovaleric acid or its ester is provided, by carbonylation of a pentenenitrile, wherein pentenenitrile is reacted with carbon monoxide and water and/or an alcohol in the presence of a catalyst system. The catalyst system contains:

- (a) a metal of Group VIII or a compound thereof and
(b) a bidentate phosphine, arsine and/or stibine ligand, wherein the bidentate ligand has the general formula (I):



- wherein M^1 and M^2 are independently P, As or Sb, R is a divalent organic bridging group, which bridging group comprises a chain of 3 to 5 atoms directly connecting the 2 phosphorus atoms, which chain consists of carbon atoms and optionally a nitrogen, oxygen or sulphur atom or a silano or dialkylsilicon group, which alkyl groups independently comprise from 1 to 4 carbon atoms, and R^1-R^4 represent the same or different optionally substituted tertiary alkyl groups,
- (c) an acid having a pKa less than 3, as measured at 18 °C in an aqueous solution.

ϵ -caprolactam is also prepared by reduction of 5-cyanovaleric acid or ester obtained above to 6-

aminocaproic acid or ester, and then cyclisation of the 6-aminocaproic acid or ester to ϵ -caprolactam.